

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number
WO 01/22806 A1

- (51) International Patent Classification⁷: **A01H 5/00**, [AU/AU]; "Erinbila", Crisps Lane, Murrumbateman, NSW 2582 (AU).
5/06, C12N 15/62
- (21) International Application Number: PCT/AU00/01183
- (22) International Filing Date: 22 September 2000 (22.09.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: PQ 3049 24 September 1999 (24.09.1999) AU
- (71) Applicants (*for all designated States except US*): **COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION** [AU/AU]; Limestone Avenue, Campbell, ACT 2601 (AU). **AUSTRALIAN WOOL RESEARCH AND PROMOTION ORGANISATION** [AU/AU]; Wool House, 369 Royal Parade, Parkville, VIC 3052 (AU).
- (72) Inventors; and
- (73) Inventors/Applicants (*for US only*): **RICHARDSON, Alan, Edward** [AU/AU]; 3 Cassia Place, Rivett, ACT 2611 (AU). **HAYES, Julie, Ellen** [AU/AU]; RMB 2730, Euroa, VIC 3666 (AU). **SIMPSON, Richard, Joseph**
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— With international search report.
— With amended claims.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: EXPRESSION OF PHYTASE IN PLANTS AS A METHOD OF MODIFYING PLANT PRODUCTIVITY

(57) Abstract: The present invention provides a method of modifying plant productivity comprising expressing in a plant cell, tissue or organ one or more genes capable of facilitating a plant's ability to utilise soil phosphorus, and, in particular, a phytase gene, wherein said phytase gene expresses a phytase polypeptide in secretable form. More particularly, the present invention provides a method of increasing plant productivity comprising expressing in the root of a plant an isolated nucleic acid molecule encoding a phytase polypeptide for a time and under conditions sufficient for said phytase to be secreted from the root. In a preferred embodiment of the invention the chemistry of the soil around the root is modified by the application of an organic acid. The invention also provides novel phytase-encoding genes: genetic constructs which are useful for performing the inventive method; and transgenic plants produced therewith having improved productivity compared to their otherwise isogenic counterparts.

WO 01/22806 A1